

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

Claims 79, 100, and 118 have been amended, and claims 114-117, 119, and 126 have been cancelled without prejudice or disclaimer. Support for the amendments to the claims is provided, for example at paragraphs [0086], [0137]-[0139] and [0162] of this application. No new matter is entered. (It should be noted that references herein to the specification and drawings are for illustrative purposes only and are not intended to limit the scope of the invention to any particular aspect of the referenced embodiments.)

Claims 118-119 and 128-129 are objected to because:

“The claims recite ‘a computer readable storage medium.’ Given the specification does not give an exhaustive list of storage medium and does not exclude transitory media like propagation medium and signals. In order to make these claims fully statutory under U.S.C. § 101(a), Examiner recommends replacing ‘storage medium’ with non-transitory medium – appropriate correction is required.”

The basis for this objection appears to be the recent Federal Circuit decision in In Re Nuijten, 500 F.3d 1346, 1357 (Fed. Cir. 2007), in which the Federal Circuit held that the applicant’s claim 14, directed to a “signal with embedded supplemental data,” failed to recite patentable subject matter under 35 U.S.C. § 101 because “[a] transitory, propagating signal like Nuijten’s is not a ‘process, machine, manufacture, or composition of matter.’” See also MPEP 2106 (IV)(B) (explaining how, if USPTO personnel determine that it is more likely than not that the claimed subject matter falls outside all of the statutory categories, they must provide an explanation to establish a *prima facie* case of patentability and citing to In Re Nuijten).

Unlike the signal of Nuijten, in this case, the “computer-readable medium” recited by

claims 118 and 128-129 is used “for storing instructions that when executed by a processor of a base station in a mobile communication system cause the base station to schedule transmissions by a plurality of mobile terminals.” Examples of types of computer readable media that can be used with the recited subject matter include, for example, RAM, EPROM, EEPROM, flash memory, registers, hard disks, CD-ROM, DVD, etc. Specification, paragraph [0175]. Thus, the “computer readable medium” recited by the pending claims, which “stores instructions” that are “executed by a processor,” is not “transitory” or “propagating.” In fact, the “computer readable medium” recited by the pending claims more closely resembles Nuijten’s claim 15, directed to a “storage medium having stored thereon a signal with embedded signal data,” which the U.S. Patent and Trademark Office found to comply with 35 U.S.C. § 101. In re Nuijten, 500 F.3d at 1351.

With respect to the objection to claim 125, claim 125 has been amended to depend from claim 124, as recommended by the Examiner.

Accordingly, it is respectfully requested that the objections to the claims should be withdrawn.

Claims 79, 81, 82, 86, 88-93, 95-97, 100, 102, 103, 107-111, 118, 120-123 and 128-129 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Terry et al (US Pub. No. 20050249133) (hereinafter, “Terry”) in view of Jorgensen (US Pub. No. 2007/0073805) (hereinafter, “Jorgensen”) and Schultz (WIPO WO 01/63855 A1). Claims 83-84, 99, 113 and 124-125 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Terry in view of Jorgensen and Schultz, as applied to claims 79 and 100 above, and further in view of Lucent-3GPP (“Scheduled and Autonomous Mode Operation for the Enhanced Uplink,” 2003, 3GPP TSG RAN WG1#31 R1-03-0284) (hereinafter, “Lucent”). Claims 98 and 112 stand rejected

under 35 U.S.C. § 103(a) as being unpatentable over Terry in view of Jorgensen and Schultz, as applied to claim 79 above, and further in view of Cheng et al (US Pub. No. 2004/0228313 A1) (hereinafter, “Cheng '313”). Claims 114-117, 119, and 126-127 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng '313 in view of Jorgensen. Claims 114-115 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Cheng '313 in view of Cheng et al. (US 7,336,632 B2) (hereinafter, “Cheng '632”). To the extent that these rejections may be applied to the claims as amended herein, the Applicants respectfully traverse as follows.

It is respectfully submitted that the rejection of claim 79 should be withdrawn for at least the following reasons.

Claim 79 has been amended and now recites the following additional underlined features:

“A method for scheduling transmissions of mobile terminal in a mobile communication system, the method comprising ...

...determining based on the identifier within the scheduling request the QoS attributes associated with the flow identified by the identifier within the scheduling request, and

scheduling by the base station the uplink resource for transmission of data of said plurality of flows to be multiplexed onto the dedicated uplink channel by said mobile terminal, based on the identifier identifying said one flow of said plurality of flows and said QoS attributes associated with the flow identified by the identifier within the scheduling request.”

According to the method recited by claim 79, Node Bs can allocate uplink resources to UEs for efficient utilization to maximize throughput in accordance with the QoS requirements of each individual mobile station. Specification, par. [0075].

In the Office Action at item 13, pgs. 8-9, the Office Action states that Terry discloses the multiplexing of MAC-d flows for transmission on the E-DCH at the WRTU, and the transmission of a “rate request” from the WRTU to the Node-B to which the Node-B responds

by returning a rate grant. (See paragraphs [0028] and [0033]). Further, the Office Action indicates that there is no teaching in Terry that the rate request comprises the features of “an identifier identifying one of the plurality of flows” and “scheduling by the base station the uplink resource for transmission of data of said plurality of flows to be multiplexed onto the dedicated uplink channel by said mobile terminal, based on the identifier identifying said one flow of said plurality of flows and its related QoS attributes,” as recited by previous claim 79. Page 9, 2nd paragraph of the Final Rejection.

To cure these deficiencies of Terry, the Office Action argues that Jorgensen teaches these features. Specifically, with respect to the feature of “scheduling by the base station...” recited by claim 79, the Office Action alleges that:

“Jorgensen discloses...scheduling by the base station (Fig. 3B – base station 302 – see paragraphs 336, 401, and 443) the uplink resource based on the identifier identifying said one flow of said plurality of flows and its related QoS attributes (see uplink and downlink frames transmitted using flow id in Fig. 13 as detailed in paragraph 482. Paragraph 482 and the abstract clearly shows the scheduler in the base station as well as in the mobile is able to impact the shared air interface channel and all flows using the shared air interface based on the scheduling request containing an IP-flow id) (emphasis in original).”

Paragraph [0482] of Jorgensen discloses in part that: “Flow scheduler 604 and 1566, and 634 and 1666, uses these downstream reservations and upstream reservation requests to assign slots to data packets in the next downstream transmission subframe 1202 and upstream transmission sub frame 1204, respectively.” Paragraph [0482] further discloses that “Reservation request blocks (RRBs), described further above with reference to FIG. 12, include a request for a number of slots for a single IP flow with an IP flow identifier # and class of the flow.” Thus, Jorgensen discloses that the flow scheduler 604 and 1566, and 634 and 1666, use

reservation request blocks (RRBs), which include a “request for a number of slots for a single IP flow with an IP identifier #”, to assign slots to data packets.

However, neither paragraph [0482] of Terry, nor any other paragraphs of Terry, teach or suggest the newly added feature of “determining based on the identifier within the scheduling request the QoS attributes associated with the flow identified by the identifier within the scheduling request,” as recited by claim 79. Terry does not disclose anywhere that the “IP identifier #” is used to determine QoS attributes. Instead, Terry simply discloses that the “IP identifier 1234c identifies the IP data flow,” (Terry, par. [0471]), and, as mentioned above, further discloses that the Reservation Request Block (RBB) includes an IP flow identifier # to be transmitted to the schedulers 604 and 1566, and 634 and 1666. Therefore, Terry does not teach or suggest the recited feature of “determining based on the identifier within the scheduling request the QoS attributes associated with the flow identified by the identifier within the scheduling request,” as recited by claim 79, and none of the other prior art references cure this deficiency of Terry.

Accordingly, it is respectfully submitted that the rejection of claim 79 should be withdrawn for at least this reason.

Furthermore, in the Office Action at page 6, item 7, the Office Action states that the presence of a MAC layer in the Node B would be “irrelevant” when considering the teaching of Schultz. Specifically, the Office Action states: “First none of the independent claims explicitly claim a MAC layer and hence Applicant’s observation is irrelevant.” The Office Action then proceeds to argue that Schultz teaches a MAC layer implemented at Node B.

It is respectfully submitted that the Office Action misapprehends both the relevance and the substance of the arguments submitted in the previous response.

First, with respect to the relevance of the arguments related to the MAC layer disclosed by Schultz, claim 79 recites the feature of "...receiving at the base station from a radio network controller Quality of Service (QoS) attributes of a plurality of flows." In the previous Office Action mailed September 1, 2009, the Office alleged that Schultz disclosed this feature:

"Schultz '855 discloses receiving at the base station (See Figure 2, Node B) from a radio network (RNC) controller (See on page 7, lines 19-27 and Page 14, lines 10-15 how Fig. 2 RNC 140 passes QoS parameters. See also Fig. 8 block 805) QoS attributes of a plurality of flows (i.e. each RAB in Figure 7 has a unique QoS known at setup by Node-B as illustrated on page 28, lines 19-22)..."

Page 28, lines 19-22 of Schultz, which the Office Action specifically relies on to anticipate the recited "QoS attributes of a plurality of flows," states the following:

"As noted hereinabove, the MAC layer of UMTS preferably schedules packets so that the total Quality of Service (QoS) provided to the end user fulfills the guarantees given when the Radio Access Bearer (RAB) 730 was established (emphasis added)."

Thus, the Office Action itself contends that the MAC layer disclosed by Schultz reads on the recited feature "...receiving at the base station from a radio network controller Quality of Service (QoS) attributes of a plurality of flows," as recited by claim 79. Accordingly, it is not irrelevant for the Applicants to discuss the MAC layer taught by Schultz, in order to directly refute the allegations made in the rejection.

Second, with respect to the substance of the arguments related to the MAC layer disclosed by Schultz, as pointed out in the previous response, Schultz discloses that QoS information is considered in the resource allocation, which is a function of the MAC layer. More precisely, it becomes apparent from page 7, lines 15 to 25 and FIG. 2 of Schultz that QoS is defined per Radio Access Bearer (RAB) and that this per-RAB QoS must somehow be made available to the scheduling functions of the MAC layer in order to consider the QoS. However,

as the MAC layer terminates at the UE and RNC (see FIG. 2 of Schultz), this indicates that the Node B is not aware of any QoS parameters, as this is transparent to the Node B due to the layered protocol stack – the Node B only terminates at the physical layer, as per Fig. 2. From this, we previously remarked that the Node B of Schultz is thus not aware of the QoS parameters negotiated for the RAB, so that Schultz cannot disclose that the QoS parameters are transmitted from the RNC to the Node B.

In response to these arguments, the Office Action alleges that “all Node Bs have a MAC layer and Schultz ’855 discloses this very fact on page 28 lines 15-18.” However, Schultz is very vague as it concerns the location of the MAC layer and the scheduler. On page 28, lines 15 to 17, Schultz discloses:

“The MAC-c, MAC-d, and RLC layers of UMTS may be located, for example, in a Radio Network Controller (RNC) 140 (of FIG. 1) of the UTRAN 130, a User Equipment (UE) 110, etc.”

This passage, however, does not explicitly mention the Node B anywhere. The Office Action apparently considers the “etc.” to indicate that the MAC layer can be terminated in the Node B, so that the scheduler would be located there and thus the Node B would be aware of the RAB QoS. This argument, however, is not supported by the disclosure of Schultz and appears to be based on impermissible hindsight. Of course, there are not many options for terminating the MAC layer besides UE and RNC (see FIG. 2 of Schultz).

The Office Action further argues on page 6, item 7, that in step 805 of FIG. 8 the MAC scheduler retrieves QoS parameters from the RRC 705 shown in FIG. 7. The Office Action appears to confuse the RNC (i.e., an entity) and the RRC layer (i.e., a protocol layer). Schultz teaches on page 29, lines 14 to 20 with respect to step 805 that:

“... several parameters are obtained for each logical channel. (Step 805.) The QoS Class for each logical channel may be obtained from the corresponding RAB parameter. The QoS Class value may be obtained directly from the RAB parameter called “QoS Class,” or it may alternatively be calculated from one or more RAB parameters using any suitable formula. The Guaranteed Rate for each logical channel may also be obtained from the corresponding RAB parameter.”

However, despite the arguments in the Office Action, this passage of Schultz does not disclose that the RRC layer provides the QoS Class, and further does not disclose that the RNC signals the QoS Class of the RABs to the Node B.

Similarly, the passage on Page 7, line 19 to 25 of Schultz— as already discussed above — also fails to disclose this feature anywhere (see citation of the passage on Page 10, 3rd paragraph of the Final Rejection). Page 7, line 19 to 25 of Schultz discloses:

“... UMTS defines a framework in which different Quality of Services (QoS) may be assigned to different RABs. Packets corresponding to a RAB that has been allocated a high QoS should be transmitted over the air interface at a high priority whilst packets corresponding to a RAB that has been allocated a low QoS should be transmitted over the air interface at a lower priority. Priorities may be determined at the MAC entity (e.g., MAC-c or MAC-d) on the basis of RAB parameters.”

This passage does not appear related to the feature in question and does not mention Node B anywhere. Similarly, the passage on page 14, lines 10 to 15 (cited in the Final Rejection) discloses nothing which would teach or suggest communicating QoS information of the RAB from the RNC to the Node B. Page 14, lines 10 to 15 of Schultz disclose:

“Preferably, the input flows to the MAC entity are provided by respective Radio Link Control (RLC) entities. Also preferably, each RLC entity provides buffering for the associated data flow. Also preferably, the step of computing a fair share of resources for an input flow is carried out by a Radio Network Controller (RNC) entity.”

Again, nothing in this passage teaches or suggests communicating QoS information of the RAB from the RNC to the Node B.

Moreover, paragraphs [0015] and [0029] of Terry, as cited in the Office Action at page 6, item 7, fail to disclose this feature as well. Paragraph [0015] of Terry discloses that the:

“RNC 300 controls overall EU operation by configuring EU parameters for the Node-B 200 and the WTRU 100 such as initial transmit power level, maximum allowed EU transmit power or available channel resources per Node-B.”

However, there is nothing mentioned in this paragraph concerning how the QoS of the individual flows would be transmitted from the RNC to the Node B.

Also, paragraph [0029] of Terry discloses that:

“The combination of MAC-d flows that can be multiplexed in on eMAC-e PDU is configured by the RNC 300. The multiplexed MAC-e PDUs are demultiplexed into MAC-d flows by the demultiplexer 224. The Node-B demultiplexing may result in MAC-d or RLC PDU reordering, and MAC-e PDU reordering may be performed by the RNC 300.”

This passage clearly relates to uplink transmissions by the UE, as the passage refers to the demultiplexer 224 of Node B (see FIG. 4), so that the passage essentially teaches that the RNC 300 can configure the combination of MAC-d flows that can be multiplexed in one MAC-e PDU by the EU, which is thus not related to a configuration of the Node B by the RNC.

In summary, not a single passage from among the numerous passages of Schultz relied on by the Office teach or suggest the recited feature of “...receiving at the base station from a radio network controller Quality of Service (QoS) attributes of a plurality of flows,” as recited by claim 79. Furthermore, neither Terry nor any of the other references cure this deficiency of Schultz.

Accordingly, it is respectfully submitted that the rejection of claim 79 should be withdrawn for at least this reason as well.

Claim 100 has been amended and now recites the feature of “a determining section adapted to determine based on the identifier within the scheduling request the QoS attributes

associated with the flow identified by the identifier within the scheduling request.” Accordingly, it is respectfully submitted that the rejection of claim 100 should be withdrawn for substantially the same reasons that the rejection of claim 79 should be withdrawn.

Claim 118 has been amended and now recites the feature of “determining based on the identifier within the scheduling request the QoS attributes associated with the flow identified by the identifier within the scheduling request.” Accordingly, it is respectfully submitted that the rejection of claim 118 should be withdrawn for substantially the same reasons that the rejection of claim 79 should be withdrawn.

In summary, it is submitted that the rejections of independent claims 79, 100, and 118, and all claims dependent therefrom, should be withdrawn for at least the above reasons.

In view of the above, it is submitted that this application is in condition for allowance, and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a direct communication, the examiner is requested to e-mail the undersigned at the address listed below.

Respectfully submitted,

/James Edward Ledbetter/

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